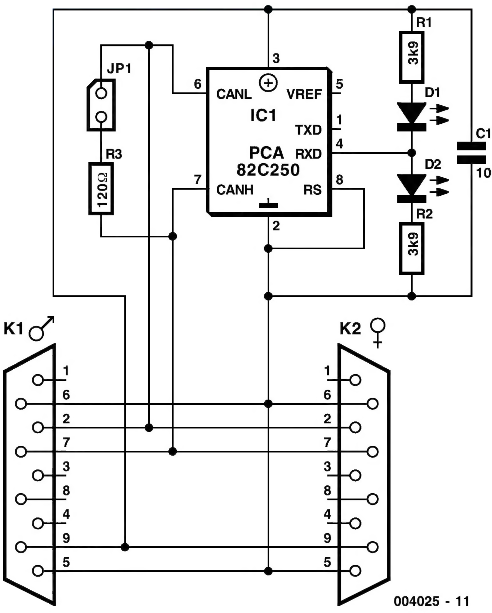
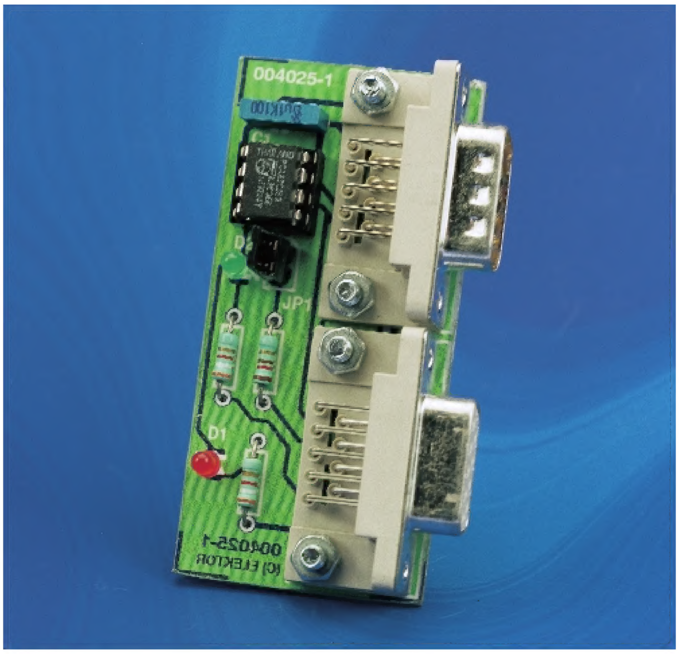
049 CANopener





A. Grace

This project was stimulated by a recent series of CAN bus articles in *Elektor Electronics*. One of the articles in the series included a constructional project (pages 20–24 in the November 1999 edition), which described a CAN bus interface. This construction project is based on that article.

At the fastest data rate of 1 Mbits/second the maximum bus length is 40 metres, whilst at the slowest speed of 50 kbits/second, the bus length can extend up to 1000 metres (1 km). If you imagine a CAN bus based on the slowest speed, the data cable could stretch for up to a maximum of 1 km — this is long enough to pass through several buildings! Take an industrial complex that uses a CAN bus to transmit data from one plant room to another (which could be on a different floor, or even in a separate building), and it develops a cable fault. You could spend hours wandering back and forth between the various bits of equipment trying to find the fault. What you need is a small hand held, loop-powered device that you can insert into the network to see if there is data on that node.

This circuit uses the Philips PCA82C250 transceiver chip. However, as the CANopener is being used to monitor CAN data only, the unused transmitter input is left floating — if grounded this could become a DOMINANT transmitter. Data enters the circuit through K2 and leaves unmodified through K1. IC1 converts the CAN bus data stream into a digital logic signal which is indicated by the two LEDs. If the CANopener is to replace a terminated piece of equipment, a terminating resistor can be switched into place through JP1, but in normal use JP1 is left open.

The PCB for this project is available ready-made from the Publishers.

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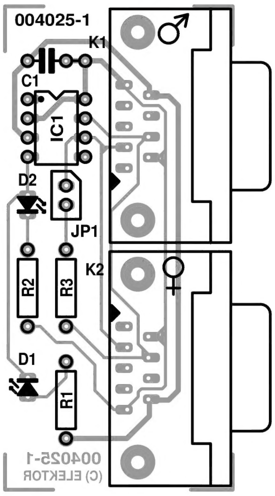

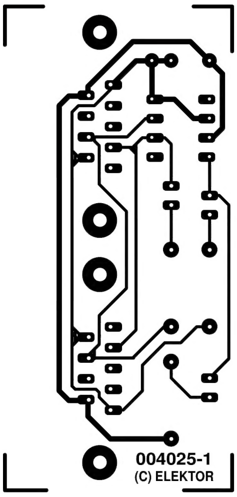

COMPONENTS LIST

Resistors:
R1,2 = 3kΩ9
R3= 120Ω

Semiconductors:
D1 = LED, 3mm, high-efficiency, red
D2 = LED, 3mm, high-efficiency, green
IC1 = PCA82C250

Miscellaneous:
K1 = 9 way sub-D male connector (plug), PCB mount version
J2 = 9 way sub-D female connector (socket), PCB mount version
JP1 = 2-way 2.54 mm pin strip and jumper